

No. 878,106.

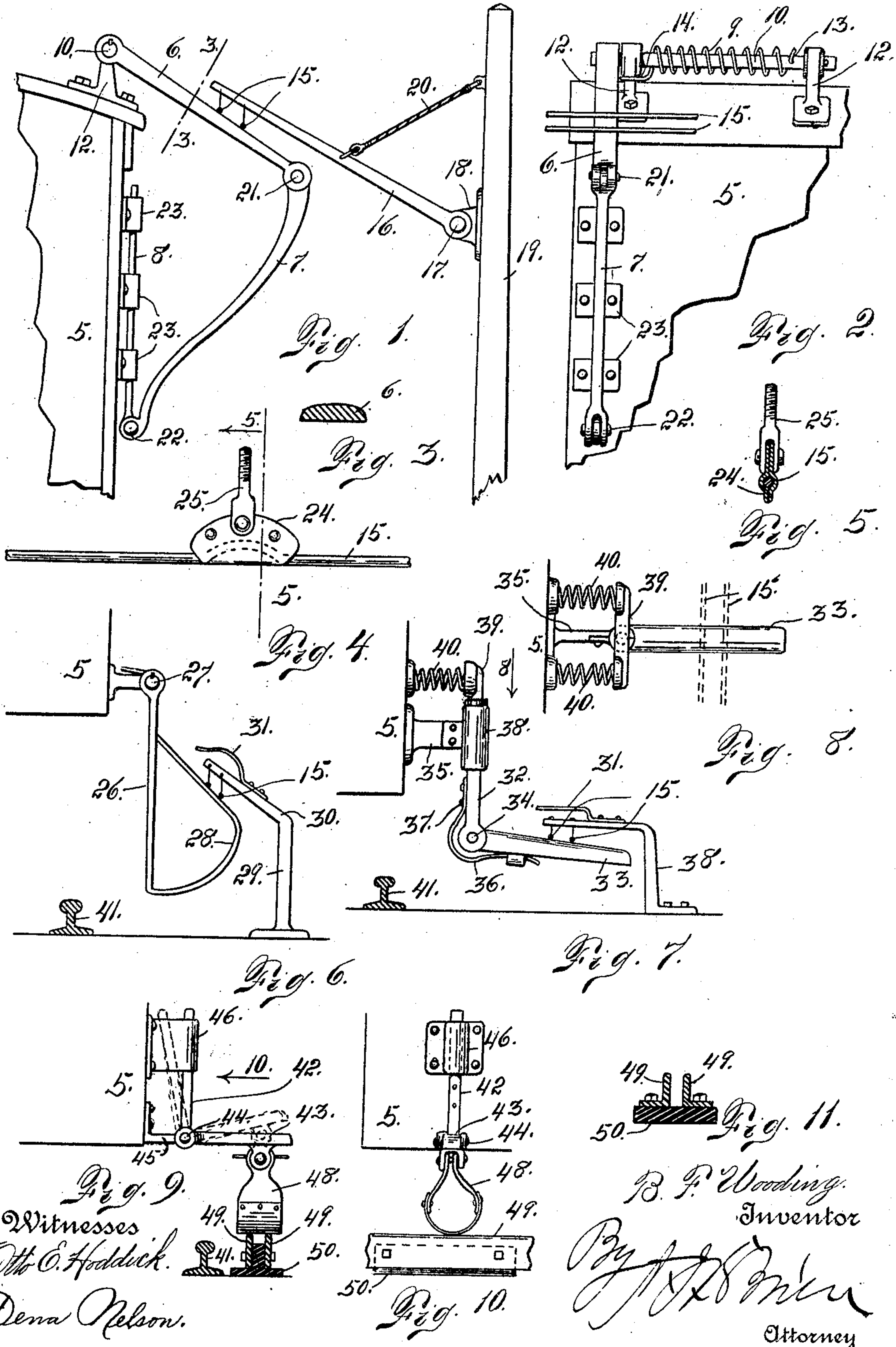
B. F. WOODING.

PATENTED FEB. 4, 1908.

ELECTRICAL SIGNALING APPARATUS.

APPLICATION FILED FEB. 23, 1906.

2 SHEETS—SHEET 1.



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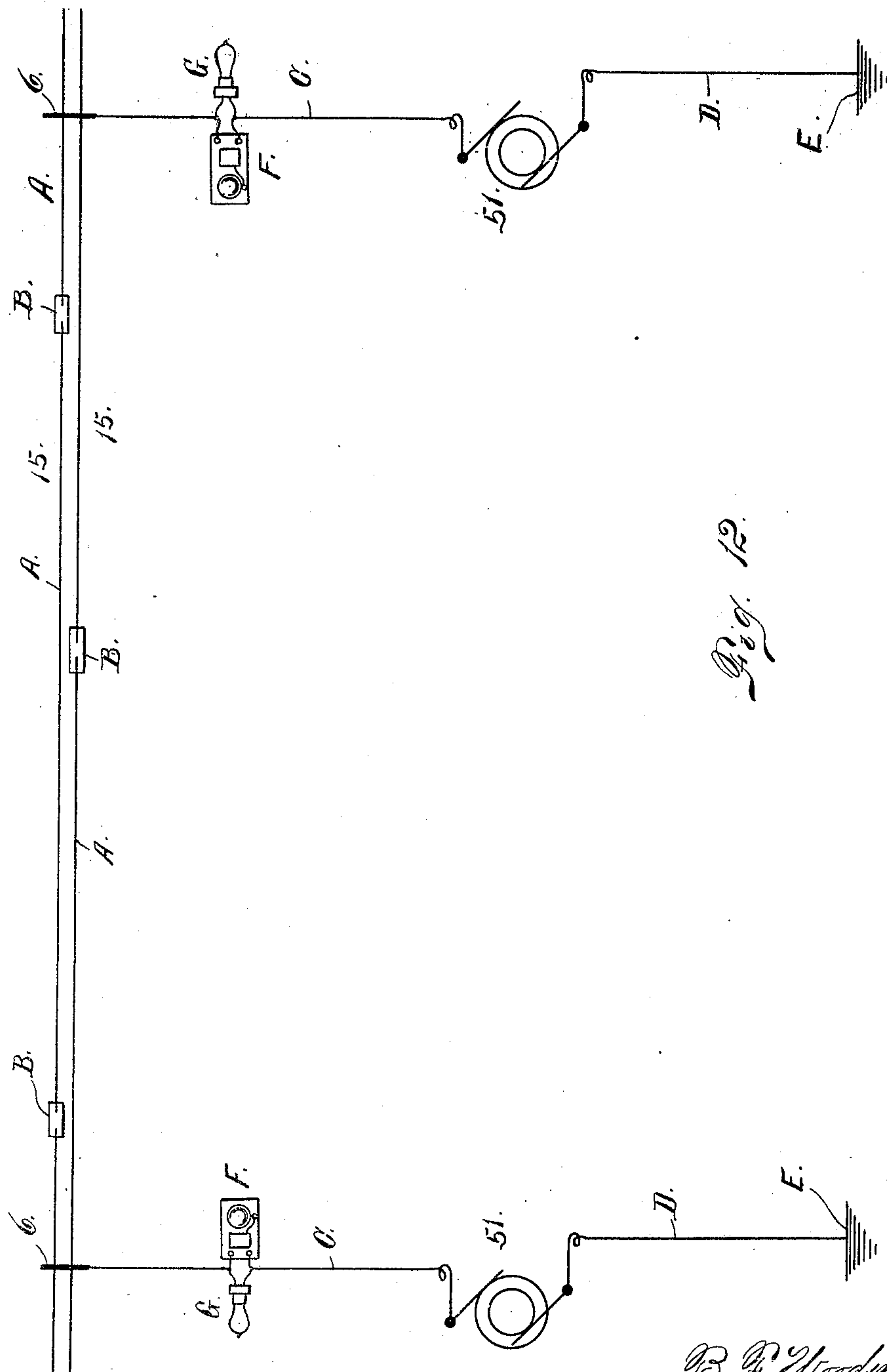


Fig. 12.

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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL SIGNALING APPARATUS.

No. 878,106.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed February 23, 1906. Serial No. 302,385.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. WOODING, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Electrical Signaling Apparatus; and I do declare the following to be full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in electrical signaling apparatus but more specifically to a special construction and arrangement of contact carried by the train and adapted to engage the conductors of a block system which conductors may be supported on poles or placed on the ground. In the latter case they would of course be insulated from the earth in order to maintain the signaling circuit intact and prevent the grounding of the current.

A special feature of my improvement consists in the fact that my improved contact is constructed and arranged to yield freely to compensate for the swaying of the train in either direction, the construction being such that perfect contact may be at all times maintained regardless of this swaying movement.

Having briefly outlined my improved construction as well as the function it is intended to perform, I will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a view illustrating my improved yielding contact shown in connection with the signaling conductors supported above the ground. Fig. 2 is a view looking toward the left in Fig. 1 showing the signaling conductors in place but with their supporting apparatus removed. Fig. 3 is a cross section taken on the line 3—3 Fig. 1. Fig. 4 is a view showing in detail the manner of supporting the overhead conductors shown in Figs. 1 and 2. Fig. 5 is a section taken on the line 5—5 Fig. 4. Figs. 6, 7, 8, 9, 10 and 11 illustrate other forms of construction. Fig. 12 is a diagrammatic view of the general arrangement of the system independently of the particular form of contact.

The same reference characters indicate the same parts in all the views.

Referring first more especially to Figs. 1 and 2 of the drawing, let the numeral 5 designate a train or a car thereof upon which is mounted a yielding contact which in this instance is composed of two arms 6 and 7, a guide rod 8 and of a torsional spring 9.

The arm 6 is made fast to a shaft 10 journaled in supports 12 fast on the car. Around the shaft 10 the spring 9 is spirally arranged, one extremity of the spring being connected with one of the supports 12 as shown at 14, while the other extremity is made fast to the shaft as shown at 13, the arrangement being such that the tension of the spring normally acts to throw the arm 6 outwardly toward the conductors 15 of the block system. These conductors are suitably supported. In this particular instance an arm 16 is pivotally mounted at 17 on a bracket 18 made fast to a pole or post 19. The downward movement of the arm 16 is limited by a support 20 which in this particular instance is shown flexible though it is evident that the arm 16 may be supported in any suitable manner.

The arms 6 and 7 are pivotally connected or jointed at 21, while the lower extremity of the arm 7 is pivotally connected as shown at 22 with the vertically disposed rod 8 mounted in guides 23 secured to the car 5. It is evident that by virtue of this construction, if the car sways or tilts toward the left, the spring 9 will act to throw the contact arm 6 outwardly and thus maintain perfect contact with the conductors 15 while if the car sways toward the left, the contact arm and its connections 6 will yield sufficiently to compensate for said movement while by virtue of the flexible connection 20 between the arm 16 and the post 19, the conductors 15 may change their relative position to facilitate the operation of the device.

In Figs. 4 and 5 a special arrangement is illustrated for supporting the conductors 15 from the arm 16. In this case shoes or clamping devices 24 are passed around the conductors 15 and secured to hangers 25 which are connected with the arm 16 in any suitable manner. As shown in the drawing the conductors are curved upwardly as indicated by the dotted lines in Fig. 4 and also as indicated by the position of the conductor 15 in Fig. 5 thus locking the conductors against longitudinal movement in the supporting



shoes. In Fig. 6 another form of movable contact is illustrated comprising an arm 26 pivotally connected with the car 5 as shown at 27 and having a band member 28 engaging the conductors 15 which are supported on a stationary support 29 having an inclined member 30 from which the conductors 15 are directly suspended.

Mounted upon the support 16 above the conductors 15, is a protecting plate or housing 31, to shield the conductors and their supports. The arm 26 is spring-held and spring-actuated by means of the torsional spring 9 the same as the arm 6 in Figs. 1 and 2.

In Figs. 7 and 8 still another form of construction is illustrated. In this case the contact connected with the car is composed of two members 32 and 33 pivotally connected at 34. The member 32 is mounted in a bracket 35 secured to the car 5. The arm 33 is held up against the contacts 15 by means of a spring 36 made fast to the arm 32 as shown at 37, and bent around the joint 34 to engage the arm 33 underneath thus forming a yielding support. In this instance the conductors 15 are mounted on a stationary support 38. It is assumed in all the constructions heretofore described that the signaling conductors 15 are insulated from the ground in any suitable manner. As shown in Figs. 7 and 8 the arm 32 is supposed to have a limited revoluble movement in its bearing 38. To the upper extremity of this arm 32 is attached a cross piece 39 whose extremities on opposite sides of the arm 32 are acted on by springs 40 so that in the event that the arm 32 is turned in either direction, the tendency of the spring will be to return it to its normal position. In the views designated Figs. 6, 7 and 9 one of the track rails is indicated and designated 41 in order to show that the supporting means for the signaling conductors, rest near the level of the track.

In the construction shown in Fig. 9 a bell crank lever having arms 42 and 43 is employed. This lever is fulcrumed at 44 on a bracket 45 mounted on the car. The arm 42 of the lever engages a U-shaped guide 46 in which the lever arm is adapted to move back and forth as indicated by dotted lines. Connected with the arm 43 is a depending contact 48 which engages the conductors 49 forming the block system, said conductors being separated by insulating material 50.

In Fig. 11 a slightly different construction is illustrated for insulating the conductors 49 from each other.

The insulating material is designated by the same reference character in both cases.

In Fig. 12 the manner of dividing the signaling conductors into sections A is illustrated. These sections A are insulated from each other by blocks B which are alternately arranged or staggered in the two signal-

ing conductors. As shown in the drawing the signaling current is produced by alternating current dynamos 51 mounted on the trains. The conductor C leads from one pole of each source of electricity to the contact 6 engaging the signaling conductors 15. The connection between the conductor C and the signaling conductors in Fig. 12, is designated 6 to harmonize with the contact arm designated with the same reference character in Figs. 1 and 2. Interposed in the circuit between the source and the contact 6 any desired signaling mechanism may be employed. In Fig. 12 signaling bells F and incandescent lamps G are illustrated thus giving the engineer of each train the benefit of both audible and visual signals. A conductor D leads from the other pole of the source to the ground E.

In Fig. 12 the two alternating current dynamos 51 are supposed to be mounted on two trains or the engines of two trains. In this event when the trains have reached points where both are between two of the insulating devices B of one of the conductors 15, the circuit will be completed between the trains and each engineer may be signaled through the instrumentality of suitable mechanism which will be readily understood. The blocks or sections A of the signaling conductors are supposed to be of sufficient length to prevent the possibility of collisions between trains equipped in accordance with my improvement. This system is explained and illustrated more in detail in my previous application Serial No. 232,104, filed Nov. 10th, 1904.

From the foregoing description the use and operation of my improved device will be readily understood and need not be further explained in detail.

Attention is called to the fact that the various contact devices disclosed and heretofore described are so constructed that in case the signaling conductors 15 should become detached from their support or supports at one or more points, the lower portion of the contact device as the member 7 in Fig. 1, would still maintain engagement with the conductors and as a support for the conductors is approached to which they were properly connected, the conductors will be gradually carried upwardly to their normal position upon their contact arm 6. This is the reason for the special lower construction of the various contacts.

Having thus described my invention, what I claim is:

1. In electrical signaling apparatus, the combination of signaling conductors suitably arranged, of a yieldingly-retained contact pivotally mounted on the train and having an inclined member adapted to engage the conductors in operative relation and for the purpose set forth.



2. In electrical railway signaling apparatus, the combination with signaling conductors arranged to form a block system, of a spring-actuated contact pivoted on the train and having an inclined member adapted to engage the said conductors, the movement of the contact being sufficient to compensate for the swaying of the train when in motion.

3. In signaling apparatus, the combination with signaling conductors, of a contact arm pivotally connected with the train and spring-held to permit the necessary degree of oscillation and inclined to compensate for the varying position of the train with reference to the line of the signaling conductors.

4. In railway signaling apparatus, the combination with signaling conductors arranged in sections or blocks, the extremities of the sections of the two conductors being staggered, a spring-held contact pivotally mounted on the train for closing the circuit between trains when on the same signaling

section or block, the said contact having an inclined member having sufficient movement to maintain it in operative relation with the signaling conductors regardless of the swaying movement of the train.

5. In electrical signaling apparatus for railways, the combination of conductors divided into sections or blocks, a local circuit mounted on the train, signaling mechanism included in said circuit, a yielding-retained contact pivotally mounted on the train and having an inclined member engaging the conductor, and a suitable connection between the said contact and the local circuit for closing the latter and operating the signaling mechanism, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN F. WOODING.

Witnesses:

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OTTO E. HODDICK.